Automated Decision-Making Systems (ADS) Workgroup Meeting

July 29, 2021

Agenda for July 29, 2021 Meeting

Agenda

2:30 Welcome and administrative updates – Katy Ruckle

2:35 New member introductions

2:40 Artificial Intelligence (AI) Primer and Algorithmic Bias – Santosh Putchala, Kuma, LLC

3:30 System Ranking Results – Katy

3:35 Workgroup questions and discussion – All

3:50 Open Discussion

4:05 Adjourn

Welcome and Administrative Updates

OPDP

Administrative Updates

New webpage for ADS Workgroup

OPDP Projects and Initiatives | Washington Technology Solutions

https://watech.wa.gov/privacy/projects-and-initiatives

ADS Charter

- ADS Workgroup Charter

ADS Meetings

- Thursday, July 29, 2021 (Agenda PDF)

Archived ADS Meetings

ADS Workgroup Kick-off Meeting (Thursday, July 15, 2021)

- Agenda
- Presentation slide deck
- Archived recording of meeting
- Meeting notes

New Workgroup Member Introductions

ADS Workgroup Members

	Last Name	First Name	Organization
1	Pincus	Jon	A Change Is Coming
2	Lee	Jennifer	ACLU
3	Gonzalez	Eric	ACLU
4	Block	Bill	ACLU
5	Aguilar	Nancy	CHA
6	Auffray	Brianna	CAIR-WA
7	Krustsinger	Allison	DCFY
8	Mason	Aaron	DCYF
9	Ybarra	Vickie	DCYF
10	McGrew	Elena	DES
11	Japhet	Robin	DES
12	Fisher	Greg	DOC
13	Luxton	David	DOC

	Last Name	First Name	Organization
14	Palma	Sergio	DSHS/ALTSA
15	Gogan	Jenise	DSHS/BHA
16	Mancuso	David	DSHS/RDA
17	Henson	Crystal	DVA
18	Allred	Robert	ESD
19	Gordon	Elizabeth	Governor's Committee for Disability Issues and Employment
20	Chen	Christopher	HCA
21	Ott	Cathie	HCA
22	Del Villar	Ashley	La Resistencia and Mijente
23	Glen	Kirsta	LNI
24	Ruckle	Katy	OCIO
25	Angel	Maria	UW Law
26	Puckett	Derek	WaTech

Artificial Intelligence (AI) Primer and Algorithmic Bias – Santosh Putchala, Kuma, LLC

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Featured Speaker Mr. Santosh Putchala

- Director of Privacy at Kuma, LLC
- Advises government, commercial and non-profit entities
- BA in engineering and law, and advanced degrees in cyber law, cyber security, and consumer privacy protection
- Privacy by Design and Privacy Engineering Expert
- Designated 'Privacy by Design Ambassador' by Information and Privacy Commissioner Dr. Ann Cavoukian.
- Currently serves on the IAPP Exam Development Board

Artificial Intelligence (AI) Primer and Algorithmic Bias

Automated Decision-making Systems (ADS) Workgroup Meeting
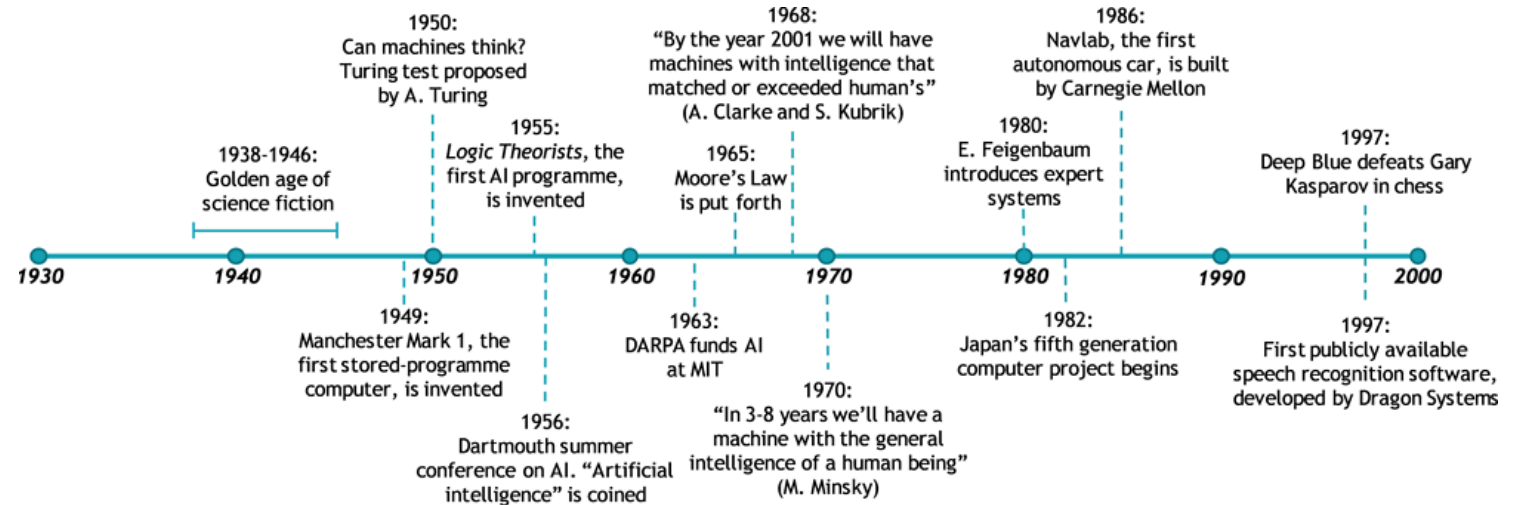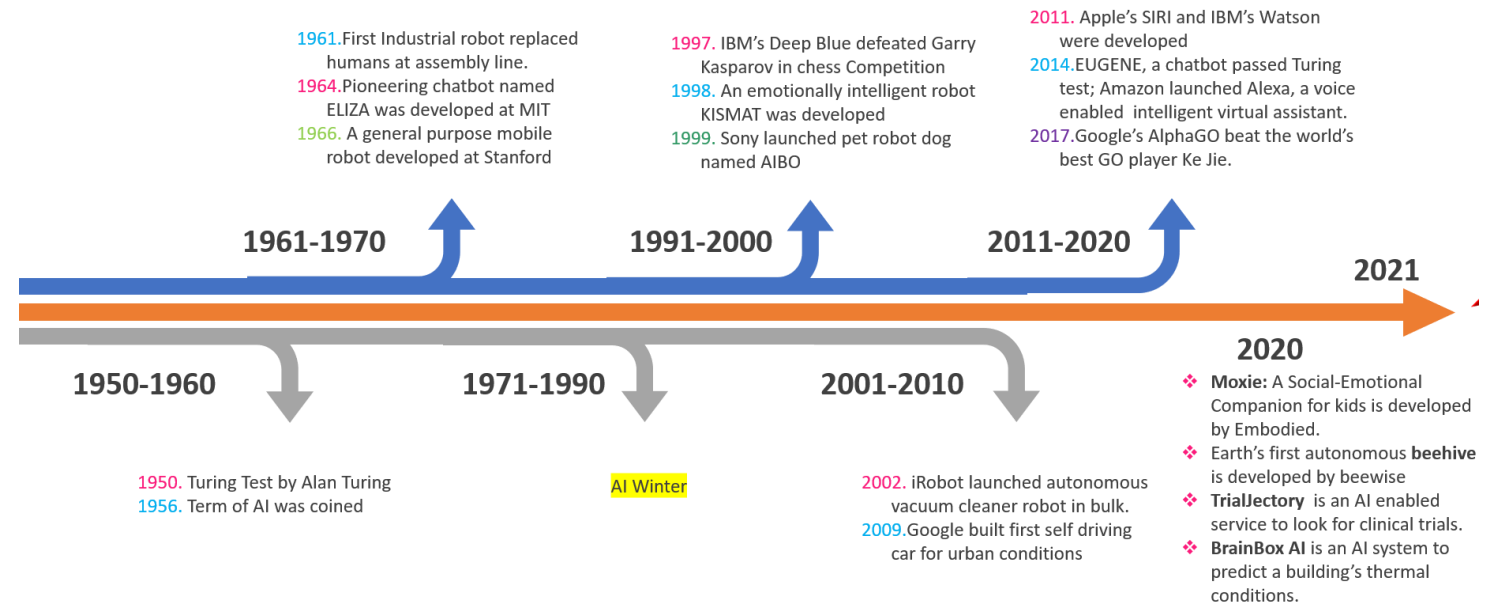
Thursday, July 29, 2021

Presented by:

Santosh Putchala
Director, Privacy – Kuma, LLC

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A brief History of
Artificial Intelligence (AI)

The Timeline of AI

1950:
Can machines think?
Turing test proposed
by A. Turing

1938-1946:
Golden age of
science fiction

1955:
Logic Theorists, the
first AI programme,
is invented

1968:
"By the year 2001 we will have
machines with intelligence that
matched or exceeded human's"
(A. Clarke and S. Kubrik)

1965:
Moore's Law
is put forth

1986:
Navlab, the first
autonomous car, is built
by Carnegie Mellon

1980:
E. Feigenbaum
introduces expert
systems

1997:
Deep Blue defeats Gary
Kasparov in chess

1930   1940   1950   1960   1970   1980   1990   2000

1949:
Manchester Mark 1, the
first stored-programme
computer, is invented

1963:
DARPA funds AI
at MIT

1982:
Japan's fifth generation
computer project begins

1997:
First publicly available
speech recognition software,
developed by Dragon Systems

1956:
Dartmouth summer
conference on AI. "Artificial
intelligence" is coined

1970:
"In 3-8 years we'll have a
machine with the general
intelligence of a human being"
(M. Minsky)

1961.First Industrial robot replaced
humans at assembly line.
1964.Pioneering chatbot named
ELIZA was developed at MIT
1966. A general purpose mobile
robot developed at Stanford

1997. IBM's Deep Blue defeated Garry
Kasparov in chess Competition
1998. An emotionally intelligent robot
KISMAT was developed
1999. Sony launched pet robot dog
named AIBO

2011. Apple's SIRI and IBM's Watson
were developed
2014.EUGENE, a chatbot passed Turing
test; Amazon launched Alexa, a voice
enabled intelligent virtual assistant.
2017.Google's AlphaGO beat the world's
best GO player Ke Jie.

1961-1970   **1991-2000**   **2011-2020**

2021

2020

1950-1960   **1971-1990**   **2001-2010**

1950. Turing Test by Alan Turing
1956. Term of AI was coined

AI Winter

2002. iRobot launched autonomous
vacuum cleaner robot in bulk.
2009.Google built first self driving
car for urban conditions

❖ **Moxie:** A Social-Emotional
Companion for kids is developed
by Embodied.
❖ Earth's first autonomous **beehive**
is developed by beewise
❖ **TrialJectory** is an AI enabled
service to look for clinical trials.
❖ **BrainBox AI** is an AI system to
predict a building's thermal
conditions.

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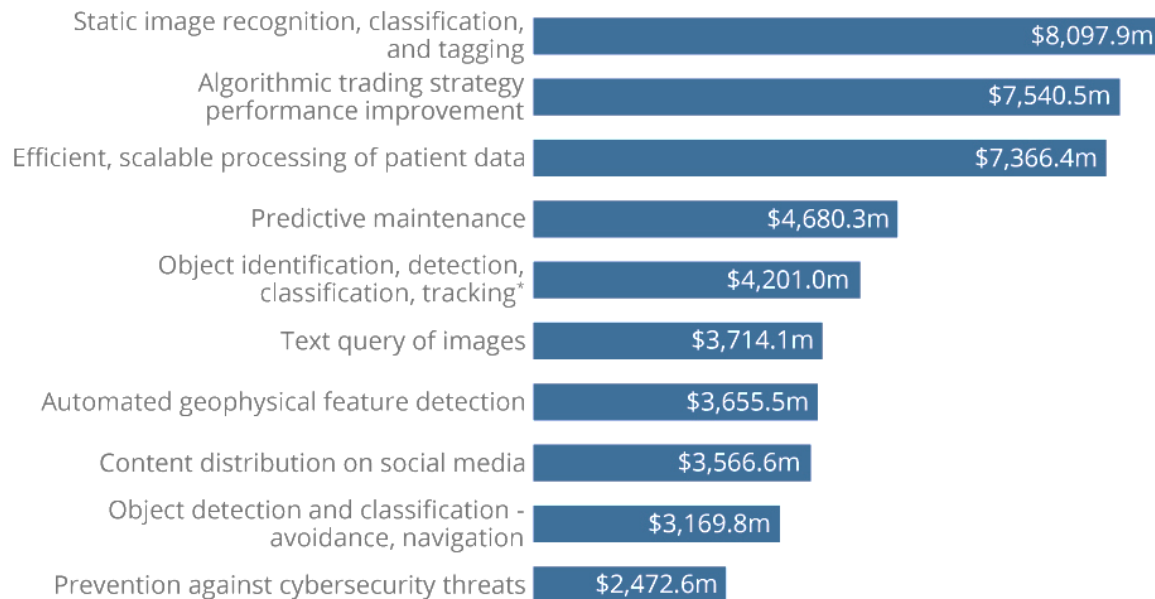# Founding Fathers of Artificial Intelligence

Alan Turing, Allen Newell, Herbert A. Simon, John McCarthy, and Marvin Minsky

Takeaway from an Industry Perspective

The Future Of A.I.
Forecasted cumulative global artificial intelligence revenue 2016-2025, by use case (U.S. dollars)
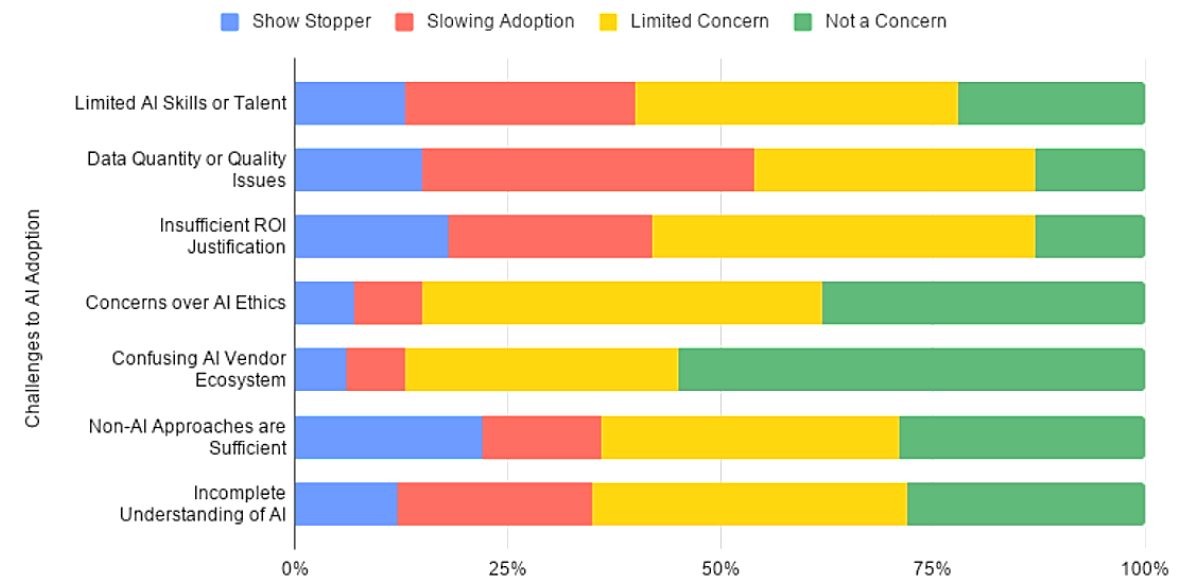
- Static image recognition, classification, and tagging — $8,097.9m
- Algorithmic trading strategy performance improvement — $7,540.5m
- Efficient, scalable processing of patient data — $7,366.4m
- Predictive maintenance — $4,680.3m
- Object identification, detection, classification, tracking* — $4,201.0m
- Text query of images — $3,714.1m
- Automated geophysical feature detection — $3,655.5m
- Content distribution on social media — $3,566.6m
- Object detection and classification - avoidance, navigation — $3,169.8m
- Prevention against cybersecurity threats — $2,472.6m

* From geospatial images
@StatistaCharts   Source: Tractica

statista

Challenges to AI Adoption
Source: Cognilytica © 2020

Legend: Show Stopper | Slowing Adoption | Limited Concern | Not a Concern

Challenges to AI Adoption:
- Limited AI Skills or Talent
- Data Quantity or Quality Issues
- Insufficient ROI Justification
- Concerns over AI Ethics
- Confusing AI Vendor Ecosystem
- Non-AI Approaches are Sufficient
- Incomplete Understanding of AI

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Takeaway from an Industry Perspective

How Companies Around the World Are Using Artificial Intelligence

IT activities are the most popular.

Activity	Value
Detecting and detering security intrusions	44%
Resolving users' technology problems	41
Reducing production management work by automating it	34
Gauging internal compliance in using approved technology vendors	34
Using runbook automation	16

Information technology

Activity	Value
Anticipating future customer purchases and presenting offers accordingly	19
Improving media buying	16
Monitoring social media comments to determine overall brand affinity and issues	16
Tailoring promotions (online or offline)	15

Marketing

Activity	Value
Financial trading (e.g., high-frequency trading enabled by AI)	17

Finance and accounting

Activity	Value
Automating call distribution	15

Customer service

Artificial Intelligence (AI) and Machine Learning (ML) Usage Among U.S. Small Businesses

- 16% — Currently using
- 25% — Planning to use in the next 1-2 years
- 27% — Evaluating
- 31% — No plans to evaluate
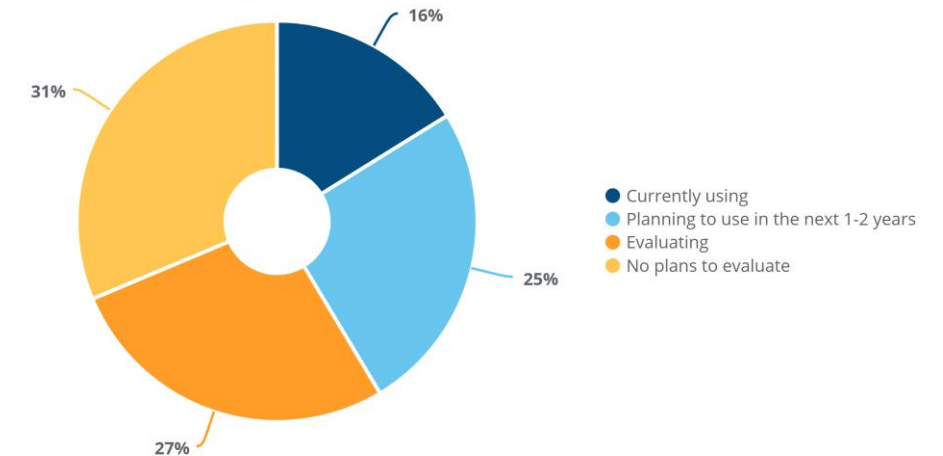
Source: Capterra Top Technology Trends Survey 2019
Q: Which of the following technologies is your organization using or planning to use in the next 1-2 years?
Chart only shows data for artifical intelligence and machine learning responses.
n: 520
Note: Percentages may not add up to 100% due to rounding.

◀ Capterra

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Global AI Strategy Landscape

50 National Artificial Intelligence Policies as at February 2020.

Argentina
Drafting the "National Plan of Artificial Intelligence". Falls under the Innovative Argentina 2030 Plan and the 2030 Digital Agenda.

Australia
November 2019, AI Roadmap focused on specialization in health, infrastructure and natural resources. Planning for an additional 161,000 AI specialists by 2030.

Austria
June 2019, 'Artificial Intelligence Mission Austria 2030 (AIM AT 2030)'. Outlines seven fields for which AI will be critical

Belgium
March 2019, 'AI 4 Belgium' launched and includes seven major objectives.

Brazil
Consultation period ended January 2020. Building a network of eight research facilities focused on artificial intelligence.

Canada
2017 federal budget announced five-year, $125m plan. Led by CIFAR. Research and talent focus. First National AI Strategy.

Chile
Expected April 2020. Ministry of Science, Technology, Knowledge, and Innovation created a committee of 10 experts to develop.

China
July 2017, China launched the most comprehensive AI strategy globally with 2030 targets for a $1T RMB AI industry.

Colombia
November 2019, first draft issued for 'National Policy for Digital Transformation'. Medellin to become an AI & Robotics Centre of Excellence.

Czech Republic
May 2019, 'National Artificial Intelligence Strategy of the Czech Republic' was launched.

Denmark
March 2019, Denmark announced the 'National Strategy for Artificial Intelligence' with four key objectives.

Estonia – Kratts Strategy
May 2019, Estonian AI experts, led by government CIO produced a roadmap, later adopted as the Estonian National AI Strategy in July 2019.

Finland
June 2019, 'Leading the Way into the Age of Artificial Intelligence' identified 11 key actions following May 2017 Steering Group announcement.

France
€1.5 billion plan announced in 2018 influenced by the 'Villani Report' to transform France into a global leader in AI.

Germany
€3 billion plan announced Nov 2018 with a dedicated AI strategy to make Germany & Europe a global leader in AI.

Hungary
October 2019, Hungary announced an AI Action Plan, the first pillar of a national AI strategy, expected in 2020.

India
June 2018 working paper on using AI to ensure social growth, inclusion and positioning the country as a leader in AI.

Indonesia
Indonesia Artificial Intelligence Society (IAIS) inaugurated under Smart Indonesia in October 2019. National Strategy expected in 2020.

Ireland
Irish Economic Development Agency led process. AI Master program launched in 2018 and is 100% industry driven.

Israel
Innovation Authority, tasked with AI policies, has warned that a strategy is needed to prevent falling behind.

Italy
March 2018, AGID released a White Paper called "AI at the service of citizens," which was edited by the AI Task Force.

Japan
March 2017, Japan's AI policy, the 'Artificial Intelligence Technology Strategy', was announced second only to Canada with 'Society 5.0'.

Kenya
January 2018, government announced task force to create a five-year strategy on national use of emerging technologies.

Lithuania
April 2019, Artificial Intelligence Strategy announced "to modernize and expand the current AI ecosystem and ensure that the nation is ready"

Luxembourg
May 2019, launched 'Artificial Intelligence: a strategic vision for Luxembourg'.

Malaysia
2018, Malaysia revealed a National Artificial Intelligence Framework expanding the National Big Data Analytics Framework.

Malta
October 2019. 'A Strategy and Vision for Artificial Intelligence in Malta 2030' Malta.ai launched and aspiring to be the 'Ultimate AI Launchpad'.

Mexico
June 2018, 'Towards an AI Strategy in Mexico: Harnessing the AI Revolution', serves as a foundation for building full AI strategy.

Netherlands
November 2018. AINED published a roadmap for developing a full national strategy.

New Zealand
May 2018, AI Forum of New Zealand, released "Artificial Intelligence: Shaping a Future New Zealand."

Norway
January 2020, Norway issued its National Strategy for Artificial Intelligence.

Pakistan
Presidential Initiative for Artificial Intelligence launched December 2018, focused on training beginners in AI and advanced technology.

Philippines
Nov 2019. AIM, Aboitiz School of Innovation, Technology and Entrepreneurship (ASITE) appointed to craft an AI roadmap.

Poland
November 2019, 'Assumptions for the AI strategy in Poland' as an action plan towards developing an AI strategy.

Portugal
February 2019, 'AI Portugal 2030', seeks strengthen economic growth, scientific excellence, and human development using with AI.

Qatar
October 2019, National AI Strategy as a blueprint produced by Qatar Computing Research Institute (QCRI).

Russia
October 2019, Russia published its National Strategy for the Development of Artificial Intelligence by 2030.

Saudi Arabia
September 2019. Royal decree to establish an AI center, to align with the Kingdom's Vision 2030 program.

Singapore
May 2017. AI Singapore is a five-year, S$150 million national program launched in to enhance Singapore's capabilities in AI.

South Africa
Intsimbi Future Production Technologies Initiative" launched in 2018 with aim to advancing manufacturing sector.

South Korea
May 2018, five-year AI development plan launched with $1.95B budget.

Spain
March 2019, the Spanish Ministry of Science, Innovation and Universities launched the RDI Strategy in Artificial Intelligence.

Sweden
National Approach for Artificial Intelligence launched in May 2018.

Switzerland
An Artificial Intelligence (AI) expert group has published its recommendations for a Swiss AI strategy.

Thailand
Thailand's Digital Economy and Society (DES) Ministry has drafted the country's first artificial intelligence (AI) ethics guidelines.

Tunisia
AI Task Force and Steering Committee to develop a national AI strategy. The strategy was scheduled to be published in the first quarter of 2019.

United Arab Emirates
October 2017 announced strategy. First country to create a Ministry of AI and first in the Middle East to launch an AI strategy.

United Kingdom
April 2018, 'Sector Deal' announced. $1.24B funding as part of the UK's larger industrial strategy.

United States of America
February 2019 by Executive Order to promote and protect AI technology. AI.gov launched Mar 2019. Followed by the National Artificial Intelligence Research and Development Strategic Plan.

Vietnam
Ministry of Information and Communications developing a broad AI strategy.

Source: HolonIQ and source government strategy and policy papers.

www.holoniq.com

Takeaway from a Global Perspective

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Artificial Intelligence (AI) 101

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What is Artificial Intelligence (AI)?

Definition of *artificial intelligence*

1 : a branch of computer science dealing with the simulation of intelligent behavior in computers

2 : the capability of a machine to imitate intelligent human behavior

Definition 2

Artificial intelligence (AI) refers to the simulation of human intelligence in machines that are **programmed to think like humans and mimic their actions**.

The term may also be applied to any machine that exhibits traits associated with a human mind such as learning and problem-solving.

Definition 3

Artificial intelligence (AI) is about creating algorithms to classify, analyze, and **draw predictions from data**.

AI involves learning from new data and improving over time.

Commercial Examples Of AI-based Systems

Voice-based Virtual Assistants, Automated home vacuum cleaners, Driver-less cars, Autonomous fleets, Smart maps for navigation, AI-predicted travel booking, password-less secured cellphone login, bad-actor bans on social media platforms, conversational marketing etc.,

Automated Decision-making Systems (ADS)

What is an ADS?

Automated Decision-making System (ADS)

An Automated Decision-making System is a technical system that aims to aid and complement human decision making.

The entity codifies a set of rules that create a connection between the data and how the decision-making gets done. This system can also be set up to replace the human decision-making process to a degree.

Decision Support System (DSS)

A decision support system (DSS) is a technical system (or a computerized program) used to support determinations, judgments, and courses of action in an organization or a business.

A DSS sifts through and analyzes massive amounts of data, compiling comprehensive information that can be used in decision-making.

Technology | DSS | AI | Business Processes

Business Decision Rules

Automated Decision-making System (ADS)

Automated Decisions

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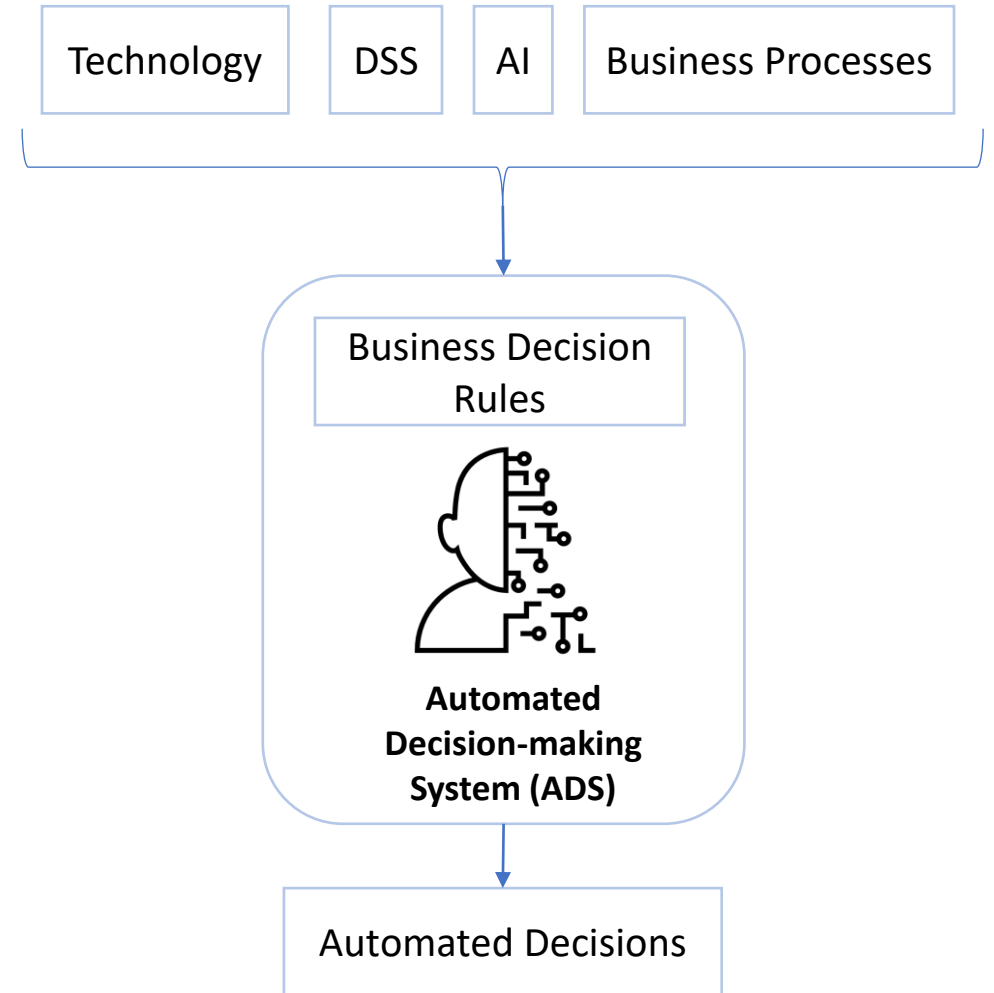
Takeaways: DSS vs ADS

Decision Support Systems (DSS)

- Decision support tools required too much time and expertise.
- Technology was available for 'limited-scope' prototypes.
- A single technology focus for structured, semi-structures and un-structured data-based decisions.
- Customized tools were difficult to use.
- Tools were standalone black boxes.
- Data were not widely available in electronic form.

Vs

Automated Decision-making Systems (ADS)

- ADS are readily maintained and updated. These operate throughout the enterprise as well.
- Technology exists in the form of large-scale systems with ability to handle large volumes of data.
- Integrated tools or suites exist.
- Off the shelf applications are simple to install and use.
- Tools are integrated with automated information sources and workflows.
- Online data are widely available as inputs to ADS.

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Applications of ADS

Building Inspection Predictive Analytics

Uses public data to identify buildings at the greatest risk for physically deteriorating conditions that endanger the health and safety of residents. Buildings identified are prioritized for inspections.

School Bus Times Algorithms System

School bus time algorithms are used to help determine the most efficient school bus routes based on a school district's objectives.

Public Benefits Fraud Detection System

Pattern recognition systems used to detect fraud or abuse of public benefits.

Tenant Harassment Predictive Analytics System

Analyzes public data to identify landlords with a high likelihood to harass tenants to help prioritize inspections for tenant harassment.

Prescription Drug Monitoring Programs System

These systems mine state prescription drug databases for irregularities that indicate doctor shopping, doctors overprescribing, and other practices that lead to abuse and overdoses. There have also been incidents of health departments alerting law enforcement to possible unscrupulous doctors for investigation.

Homelessness Prioritization Algorithms System

Uses information from different government agencies and sometimes third-parties to assess prioritized allocation of existing housing based on need. Works in conjunction with systems that identify which individuals use the greatest number of public services by analyzing data from public agencies to recommend which homeless individuals should be given housing in order to save public expenditures on homelessness.

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Potential Risks from ADS

Economic Risks

- Availability of limited choices
- Reduced availability of credit
- Differential pricing

Social Risks

- Impacts on dignity
- Bias in presented information
- Filter bubble

Risks Related to Loss of Liberty

- Heightened suspicion
- Higher susceptibility to surveillance
- Varied amount of incarceration

Risks of Opportunity Losses

- Discrimination related to employment opportunities
- Hiring biases
- Limitation or denial of education opportunities

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Mitigation of Potential Risks from ADS

Sample Mitigation Method per Component:

- **Technology Component:** Algorithmic design review and due-diligence
- **DSS Component:** Incorporation of check-points to ensure trigger of manual reviews
- **AI Component:** Review for Data Related Risks, AI/ML Attacks, Testing and Trust, and Compliance
- **Business Process Component:** Ethics framework, best practices to monitor & evaluate outcomes, all supported by a governance framework
- **Business Decision Rules:** Updates based on key changes to the business landscape of the entity. Periodic internal and third-party reviews.
- **Automated Decisions:** Review of the outputs of ADS at a minimum on a statistically sound sample basis.

Others:

- **Policy Component:** Requirement to conduct DPIA (Data Protection Impact Assessment) for high-risk decisions
- **Historical facts Component:** Measures to ensure that data processed by the ADS does not magnify historical bias

| Technology | DSS | AI | Business Processes |

Business Decision Rules

Automated Decision-Making System (ADS)

Automated Decisions

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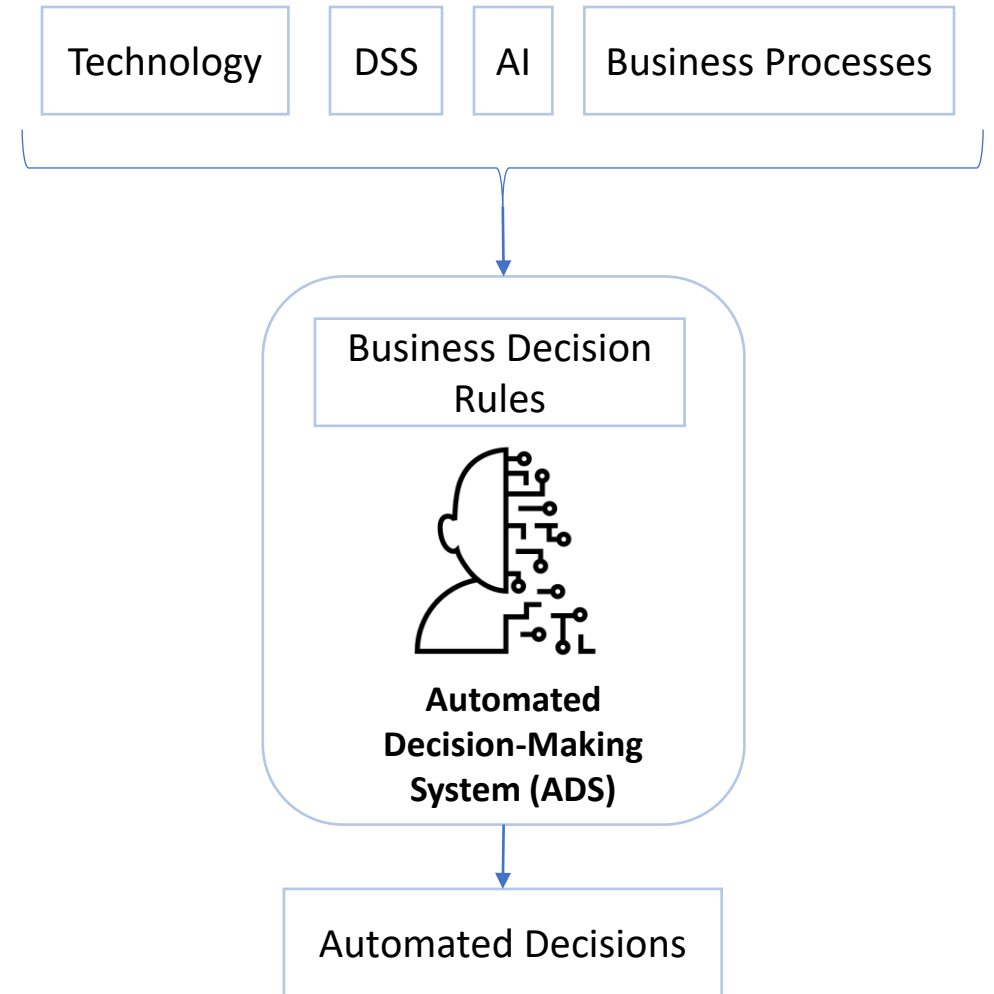
Algorithmic Bias 101

What is Algorithmic Bias ?

Algorithm

- A series of steps that we follow to accomplish a task.
- Artificial Intelligence (AI) is a special type of algorithm because they are inherently required to find patterns and methods that can be used to make decisions on behalf of humans using a programmed protocol.

Bias

- Whatever causes an unfair action or inaction.
- Can sometimes lead to harm. Prejudice, hate and ignorance can be some of the contributing factors.

Algorithmic Bias

- Whatever causes the algorithm to produce unfair actions or representations.
- Algorithms are based on mathematics but being mathematical does not necessarily mean 'objective'.
- Biases that exist in workplace, culture or community enter into the process and ultimately find a place within the model or code.

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Types of Algorithmic Bias

Algorithmic Prejudice	Algorithmic Negative Legacy	Algorithmic Underestimation
• Occurs when there is a statistical dependence [correlation] between protected features and other information used to make a decision. • Example: Early predictive policing algorithms did not have access to racial data when making predictions, but the models relied heavily on geographic data (e.g., zip code), which is correlated with race. In this way, models that are "blind" to demographic data like gender and race can still encode this information through other features that are statistically correlated with protected attributes.	• Refers to bias already present in the data used to train the AI model. • Example: AI/ML models trained to perform language translation tasks tended to associate female names with attributes like "parents" and "weddings," while male names had stronger association with words like "professional" and "salary." It is unlikely that the model is picking this association up on its own; rather, it is trained on a corpus of text that reflects these gender tropes.	• Occurs when there is not enough data for the model to make confident conclusions for some segments of the population. • Example: A global e-commerce company recently trained a machine learning model to screen applicants in its hiring process, but like many other tech companies, global e-commerce company has a disproportionately high male workforce. This data imbalance made its AI model provide stronger recommendations for male applicants. Recognizing the bias in recommendations made by the model, the company scrapped this model from their recruiting pipeline.

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What Causes Algorithmic Bias ?

Historical human, cultural or institutional biases

- Historical human biases are shaped by pervasive and often deeply embedded prejudices against certain groups, which can lead to their reproduction and amplification in computer models.

Incomplete or unrepresentative training data

- Insufficient training data is another cause of algorithmic bias. If the data used to train the algorithm are more representative of some groups of people than others, the predictions from the model may also be systematically worse for unrepresented or under-representative groups.

Algorithms with too much data

- Researchers at Georgetown Law School found that an estimated 117 million American adults are in facial recognition networks used by law enforcement, and that African-Americans were more likely to be singled out primarily because of their over representation in mug shot databases.

Negative feedback loop-based suggestions

- Potential negative feedback loops occur due to unavailability of other valid facts that cause an algorithm to become increasingly biased over time.

Reinforcement with human intervention

- Involvement of untrained, semi-trained or fatigued personnel in the ADS process for activities such as intake, outside system processing, ad-hoc processing, override processing etc.,

Use of an 'out of context' algorithm

- Data processing activities are context based. When an out of context algorithm is applied on data, results may not only be erroneous [sometimes undetectable], but also biased.

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Detection & Mitigation of Algorithmic Bias

Have an audit framework in place

- Explore this method to audit algorithm's code and the data from its results.
Supplement this with viewing an algorithm's potential effects through interviews and workshops with employees.

Ensure interpretability

- Some types of ADS systems, for example those using deep learning, may be difficult for a human reviewer to interpret.
- If the inputs and outputs of ADS systems are not easily interpretable, and other explanation tools are not available or reliable, there is a risk a human will not be able to meaningfully review the output of an ADS system.

Distinguish 'solely automated' from 'non-solely automated' ADS systems

- Organizations should take a clear view on the intended use of any ADS system from the beginning.
- They should specify and document clearly whether AI will be used to enhance human decision-making or to make solely automated decisions.

Utilize open-source tools to detect Bias

- Pymetrics: Audit AI [https://github.com/pymetrics/audit-ai]
- Skater [https://github.com/oracle/Skater]
- What-If Tool [https://pair-code.github.io/what-if-tool/]
- AI Fairness 360 [https://github.com/Trusted-AI/AIF360]

Minimize other risk-factors such as 'Automation Bias'

- Business and system owners must think about what features they would expect the ADS system to consider and which additional factors the human reviewers should look at.
Meaningful human review shall be an integral part of ADS.

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Examples of
Automated Decision-making Systems
(ADS)

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Examples of ADS

DNA Analysis System

These systems interpret forensic DNA samples by performing statistical analysis on a mixture of DNA from different people to determine the probability that a sample is from a potential suspect. This process is also known as probabilistic genotyping.

Risk Assessment Tools in Criminal Justice

Uses existing criminal justice data to produce a "risk score" to inform decisions made pre-trial, during incarceration, sentencing, and parole/probation

School Assignment Algorithm

Used to assign students to schools for k-12. Used to match eighth-graders to high schools based on preference, test scores, portfolios, and other requirements.

Automated License Plate Reader System

Automated License Plate Readers are high speed, computer-controlled camera systems that automatically capture all license plate numbers that come into view, along with the location, date, and time, and sometimes photographs of the vehicle and its drivers and passengers.

Fire Risk Assessments Tool

Fire Risk Assessments use data mining to predict which areas of the forest or buildings are at highest risk of catching fire.

Healthcare Delivery and Workflow Decision Systems

These are software and IT infrastructure intended to provide predictive analytics for care providers and hospital systems to ascertain how best to distribute healthcare resources.

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Points to Note: AI, ADS & AB

- Bias is neither new nor unique to AI.
- The end goal of mitigation is not to achieve zero risk.
- Identifying, understanding, measuring, managing and reducing bias are the intended outcomes of the risk mitigation process.
- Standards and guides are needed for terminology, measurement, and evaluation of bias.

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Thank You !

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Further Reading: 1 of 2

- Algorithmic Bias in Health Care: https://www.hsph.harvard.edu/ecpe/how-to-prevent-algorithmic-bias-in-health-care/
- Algorithmic Bias: Why Bother?: https://cmr.berkeley.edu/2020/11/algorithmic-bias/
- Artificial intelligence and algorithmic bias: implications for health systems: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6875681/
- Algorithmic Bias and Governance: https://ischool.uw.edu/events/2021/05/ischool-spring-lecture-algorithmic-bias-and-governance
- Using artificial intelligence to make decisions: Addressing the problem of algorithmic bias (2020): https://humanrights.gov.au/our-work/rights-and-freedoms/publications/using-artificial-intelligence-make-decisions-addressing
- Algorithmic Bias and the Weaponization of Increasingly Autonomous Technologies: https://unidir.org/publication/algorithmic-bias-and-weaponization-increasingly-autonomous-technologies
- Bias in Library Search Systems: https://libguides.rowan.edu/c.php?g=1033634&p=7494656
- IEEE P7003 - Algorithmic Bias Working Group: https://sagroups.ieee.org/7003/
- Algorithmic Bias in Marketing: https://store.hbr.org/product/algorithmic-bias-in-marketing/521020
- What Do We Do About the Biases in AI?: https://hbr.org/2019/10/what-do-we-do-about-the-biases-in-ai
- Algorithmic Bias in AI-Assisted Conversations: https://cssh.northeastern.edu/nulab/algorithmic-bias-in-ai-assisted-conversations/
- Algorithmic Bias: A Counterfactual Perspective: https://bitlab.cas.msu.edu/trustworthy-algorithms/whitepapers/Bo%20Cowgill.pdf
- Algorithmic Bias: On the Implicit Biases of Social Technology: http://philsci-archive.pitt.edu/17169/
- Combatting Algorithmic Bias in Recruiting: https://digitalstrategies.tuck.dartmouth.edu/publication/combatting-algorithmic-bias-in-recruiting/
- Proceedings from Duke Forge Conference on Algorithmic Bias in Machine Learning: https://forge.duke.edu/news/proceedings-duke-forge-conference-algorithmic-bias-machine-learning-now-available

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Further Reading: 2 of 2

- Remarks of FTC Commissioner Rebecca Kelly Slaughter Algorithms and Economic Justice: https://www.ftc.gov/system/files/documents/public_statements/1564883/remarks_of_commissioner_rebecca_kelly_slaughter_on_algorithmic_and_economic_justice_01-24-2020.pdf
- Dissecting racial bias in an algorithm used to manage the health of populations: https://science.sciencemag.org/content/366/6464/447
- A Legal Approach to "Affirmative Algorithms: https://hai.stanford.edu/news/legal-approach-affirmative-algorithms
- Algorithmic bias and fairness: https://www.telecom-paris.fr/en/research/strategic-focuses/data-science-artificial-intelligence/algorithmic-bias-fairness
- Who Is Responsible for Biased and Intrusive Algorithms?: https://knowledge.wharton.upenn.edu/article/who-is-responsible-for-biased-and-intrusive-algorithms/
- Reviewable Automated Decision-Making: A Framework for Accountable Algorithmic Systems: https://arxiv.org/pdf/2102.04201.pdf
- Automated decision-making and participation in Germany: https://www.ohchr.org/Documents/Issues/Poverty/DigitalTechnology/AlgorithmWatchAppendix1.pdf
- Automation and Accountability in Decision Support System Interface Design: https://scholar.lib.vt.edu/ejournals/JOTS/v32/v32n1/pdf/cummings.pdf
- Artificial Intelligence (AI), Definition: https://csrc.nist.gov/glossary/term/artificial_intelligence
- NIST Workshop on Bias in AI: https://www.nist.gov/system/files/documents/2020/08/14/Pre-Workshop%20Brief%20Final_0.pdf
- Artificial Intelligence and National Security: https://fas.org/sgp/crs/natsec/R45178.pdf
- Understanding AI Technology: https://www.ai.mil/docs/Understanding%20AI%20Technology.pdf
- Final Report from National Security Commission on Artificial Intelligence: https://www.nscai.gov/wp-content/uploads/2021/03/Full-Report-Digital-1.pdf

KUMA

System Selection and Rankings

Need more votes!

- Only twelve workgroup members voted
- Would like to have a quorum at least to base decision on system selection
- Will resend out the link to workgroup members who did not vote
- If you need a refresher on the systems we reviewed – presentation recording and slide decks are on the ADS website
- To understand ranking – weighted 1st, 2nd, 3rd, 4th choices
  - 1st = 4 pts
  - 2nd = 3 pts
  - 3rd = 2 pts
  - 4th – 1 pt

Workgroup Member Questions and Discussion

Open Discussion

Thank you!